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(54) Installation structure of an outdoor communication device

(57) A mounting pole 2a is independently installed in a place such as a park or a road where the beauty of the environment is an important factor. The mounting pole 2a has a communication mounting part 9a on the top thereof. A communication device 1a for outdoor use has an antenna 3a directly fixed on the top thereof and removably fitted in a groove of the device mounting part 9a. The device 1a has a connector 7a and no wiring thereof is exposed to the outside. The device 1a is electrically connected with the outside device through the connector 7a. In the mounting part 9a of the mounting pole 2a, there is provided a connector 8a at a position suitable for connection with the connector 7a in fitting engagement relationship. Wirings 10a interconnecting the connector 8a and the outside device are all laid through the interior of the mounting pole 2a. Consequently, none of the wirings 10a is exposed to the outside.

FIG. 4

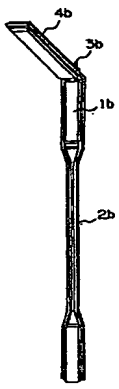
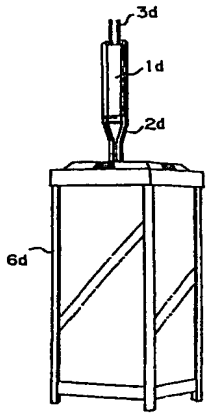


FIG. 6



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Description

BACKGROUND OF THE INVENTION

Field of the Invention:

The present invention relates to an installation structure of an outdoor communication device, and more particularly to an installation structure of an outdoor communication device having excellent maintainability and pleasing external appearance which is fit to be installed in a place where a pleasing appearance is required as an important factor, such as a public place or a town which is constructed according to a well prepared development plan.

Description of the Related Art:

Since an outdoor communication device to be installed outdoors is generally installed in a public place, its exterior appearance is a matter of importance. Further, in the case that the outdoor communication device is installed in an existing town which has been designed according to an integrated development plan, the outdoor communication device needs to have an appearance in keeping with its environment.

Since conventional outdoor communication devices have been installed after the completion of the construction of structures such as buildings, utility poles or telephone poles, priority has been given only to their functions, and hence no consideration has been given to their appearances. For example, according to the conventional installation structure as disclosed in Japanese Patent Laid-open No. 184206/90 and shown in FIG. 1, a communication device 1X is mounted on a base plate 10X by means of screws and fixed to a utility pole or telephone pole 5X by means of a metal fixture 11X provided on the base plate 10X. Or, in some cases, metal fixture is mounted directly to the communication device, without providing a base plate. A wiring 13X is drawn out of a hole in the outside surface of the communication device 1X and fixed to the utility pole or the telephone pole 5X by a fixing band 12, the wiring 13X being exposed to the outside.

In the conventional installation structure of the outdoor communication device as described above, since mounting or detaching the communication device on and from the base plate is not easy and the maintainability of the communication device is poor, the communication device cannot be placed on an elevated spot and consequently an antenna which has to be placed in an elevated spot needs to be separated from the communication device. As a result, there is a problem that the loss of the communication device becomes larger due to extended length of the wiring laid between the antenna and the outdoor communication device.

Further, the communication devises and mounting poles are designed without paying special attention to their appearance, and hence wiring is exposed and visible, often spoiling the surrounding visual environment. Particularly, in a town highly developed in accordance with street-planning criteria, utility cables are buried in the ground and there are no telephone or other utility poles permitted so that the installation space for the communication devices is limited. Therefore, if the communication devices are installed after the town is completed, the appearance of the environment will be impaired.

JP 6-053894 describes a radio base station for mobile communication in which the radio base station is provided within a pole with a strut for supporting a street lamp. The base station has a body part fixed to the inside of the strut.

JP 4-238424 describes a cellular zone system in which a base station antenna is fitted to a telephone box.

SUMMARY OF THE INVENTION

The present invention has been developed in view of the above problems of the prior art. An object of the present invention is to provide an installation structure of an outdoor communication device which has excellent maintainability and accords with the surroundings.

In a first aspect, the present invention provides an installation structure of an outdoor communication device comprising an outdoor communication device and a mounting part, wherein said outdoor communication device is connected to said mounting part by means of a connector, and said mounting part has a streetlight unit and is attached to a pole having a further function, for example a utility pole or a telephone pole.

In a second aspect, the present invention provides an installation structure of an outdoor communication device comprising an outdoor communication device and a mounting device, wherein said outdoor communication device is connected with said mounting part by means of a connector, and said mounting part is installed on the top of a telephone booth so as to be integral with said telephone booth.

As described above, mounting and detaching operation of the outdoor communication device is simplified by connecting the outdoor communication device and the mounting part through the connector, and hence the communication device of the present invention can be of service with excellent maintainability. Being constituted as above, the outdoor communication device of the present invention can be installed in an elevated spot and the antenna can be directly mounted thereon.

As described above, a streetlight unit may be provided on the top of the mounting pole to imitate a streetlight. Hence the mounting pole of the present invention can be installed in the street without compromising the appearance of the street, particularly in an urban development subject to street planning restrictions.

Further, even when a space for installing the

mounting part cannot be obtained and the mounting part has to be installed on existing facilities, it is possible to attach the mounting part to an existing utility pole or a telephone pole in imitation of a streetlight mounted on the existing pole or to install the mounting part on an existing telephone booth so as to be integrated thereinto, thereby integrating the outdoor communication device into the environment.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view showing an installation structure of a conventional communication device.

FIG. 2 is a perspective-view showing an installation structure with reference to outdoor communication device.

FIG. 3 is an enlarged view showing principal parts of the outdoor communication device of FIG. 1 before it is assembled.

FIG. 4 is a perspective view showing a first embodiment of an installation structure with respect to the outdoor communication device of the present invention.

FIG. 5 is a perspective view showing a second embodiment of an installation structure with respect to the outdoor communication device of the present invention.

FIG. 6 is a perspective view showing a third embodiment of an installation structure with respect to the outdoor communication device of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Embodiments of the present invention will next be described with reference to the drawings.

FIG. 2 is a general perspective view showing an installation structure with respect to outdoor communication device.

FIG. 3 is an enlarged view showing the upper part of a mounting pole before the communication device of FIG. 2 is mounted thereon.

As shown in FIG. 2 and FIG. 3, a mounting pole 2a is independently installed on a spot in a park or a road where appearance is an important factor. The mounting pole 2a is a hollow pole in the form of an selfsupported pole and is provided with a communication device mounting part 9a on the top thereof. Communication device 1a for outdoor use is mounted on the communication device mounting part 9a of the mounting pole 2a by fitting it releasably into the mounting part 9a. The mounting pole 2a has wirings 10a laid from the outside into the interior thereof to connect the wiring 10a to the communication device 1a through a connector.

In other words, the communication device 1a has an antenna 3a provided directly on the top thereof, and is mounted by being fitted releasably in a groove of the communication device mounting part 9a provided on the top of the mounting pole 2a. The communication device 1a has a connector 7a and is electrically connected with the outside device through the connector 7a without exposing any wirings thereof to the outside. On the other hand, in the communication device mounting part 9a of the mounting pole 2a, there is provided a connector 8a at a suitable position so as to be coupled with the connector 7a, and the wirings 10a from the connector 8a to the outside device are all laid through the interior of the mounting pole 2a. Therefore, the wirings 10a are not exposed to the outside. The wirings 10a are connected to the outside device through the interior of the mounting pole 2a and the ground to output signals received by the communication device 1a to outside device or to receive communication signals or power source signals transmitted from the outside. By moving the communication device 1a in the direction of an arrow in FIG. 3, the communication device 1a can be mounted to the communication device mounting part 9a and the connector 7a can also be fitted in the connector 8a at the same time. This communication device 1a is, for example, a simplified portable telephone base station for radio communication.

FIG. 4 is a general perspective view showing a first embodiment of the installation structure with respect to the outdoor communication device of the present invention.

As shown in FIG. 4, according to the present embodiment, since the mounting pole 2b has a selfsupported streetlight-like configuration in imitation of a streetlight, with a streetlight unit 4b being mounted on the mounting pole 2b, the mounting pole 2b may accord with the environment. In this case, of course, the communication device 1b with an antenna 3b is releasably mounted on the mounting pole 2b. With reference to the other parts, the present embodiment is constituted in the same way as the arrangement described with reference to Figures 2 and 3.

According to each of the installation structures described above, the mounting part and the communication device are connected by means of a connector in such a manner that the communication device can easily be releasably mounted to the mounting part and hence the communication device can be installed in an elevated spot. Therefore, an antenna which needs to be installed in the elevated spot can be mounted directly on the communication device thereby eliminating wirings between the antenna and the outdoor communication device, with a result that signal transmission loss due to wirings is eliminated, and signal loss or transmission loss of the communication device due to the wirings can be reduced.

FIG. 5 is a perspective view of a second embodiment of the installation structure with respect to the outdoor communication device of the present invention.

As shown in FIG. 5, the present embodiment is applicable in the case that an installation space, which is provided in the aforementioned arrangements, is not available and the communication device needs to be

installed on the existing facilities.

That is, a mounting part 2c for mounting communication device, a streetlight unit 4c, and communication device 1c having an antenna 3 on its top are formed into a single body and mounted to an existing utility pole or a telephone pole 5c by means of a metal fixture 11C in such a manner that these devices take an appearance of an ordinary streetlight. Hence, the installation structure as described above may be integrated into the environment. In the above installation structure, the communication device 1c is releasably mounted on the mounting part 2c by fitting it into the part 2c.

FIG. 6 is a perspective view of a third embodiment of the installation structure with respect to the outdoor communication device of the present invention.

As shown in FIG. 6, the installation structure of the present embodiment is arranged such that a mounting part 2d in the form of a short pole having thereon a communication device 1d is fixed to the top of an existing telphone booth 6d so that it may look as if it is a part of the telephone booth 6d. The installation structure of the present embodiment includes the mounting part 2d and the telephone booth 6d which are formed into a single body, so that they can be integrated into the environment. As for other parts, the installation structure is constituted in the same way as the second, embodiment.

In the above second and third embodiments, the wiring from the mounting part are led to a utility pole or telephone pole and telephone booth respectively and connected to the outside device.

Since the present invention has a constitution as described above, it produces such effects as follows:

Since the present invention has simplified process of mounting and dismounting outdoor communication device on and from a mounting part of a mounting pole by connecting the outdoor communication device and the mounting part through a connector, the outdoor communication device has excellent maintainability and can be installed in an elevated spot. As a result, an antenna can be mounted directly on the communication device, thereby eliminating wirings between the antenna and the outdoor communication device, and hence, the loss of the outdoor communication device is reduced and also damage due to vandalism can be avoided.

Also, according to the present invention, the street light unit is provided on the top of the mounting pole to imitate a street light, and hence the mounting pole can be installed in the street without detriment to the visual environment.

Further, according to the present invention, since a mounting part is arranged so as to be integrated into the environment by providing the mounting part in imitation of a streetlight, which mounting part is attached to an existing utility pole or a telephone pole or attached onto a telephone booth so as to be integrated thereinto, even when an installation space for the mounting pole cannot be obtained and the outdoor communication device needs to be installed on an existing structure, it is possible to install the outdoor communication device without spoiling the visual environment.

Each feature disclosed in this specification (which term includes the claims) and/or shown in the drawings may be incorporated in the invention independently of other disclosed and/or illustrated features.

Statements in this specification of the "objects of the invention" relate to preferred embodiments of the invention, but not necessarily to all embodiments of the invention falling within the claims.

The description of the invention with reference to the drawings is by way of example only.

The text of the abstract filed herewith is repeated here as part of the specification.

A mounting pole 2a is independently installed in a place such as a park or a road where the beauty of the environment is an important factor. The mounting pole 2a has a communication mounting pole 9a on the top thereon. A communication device 1a for outdoor use has an antenna 3a directly fixed on the top thereof and removably fitted in a groove of the device mounting part 9a. The device 1a has a connector 7a and no wiring thereof is exposed to the outside. The device 1a is electrically connected with the outside device through the connector 7a. In the mounting part 9a of the mounting pole 2a, there is provided a connector 8a at a position suitable for connection with the connector 7a in fitting engagement relationship. Wirings 10a interconnecting the connector 8a and the outside device are all laid through the interior of the mounting pole 2a. Consequently, none of the wirings 10a are exposed to the outside.

Claims

1. An installation structure of an outdoor communication device comprising:

   an outdoor communication device and a mounting part;

   wherein said outdoor communication device is connected to said mounting part by means of a connector, and said mounting part has a streetlight unit and is attached to a pole having a further function, for example a utility pole or a telephone pole.

2. An installation structure of an outdoor communication device comprising:

   an outdoor communication device and a mounting device;

   wherein said outdoor communication device is connected with said mounting part by means of a connector, and said mounting part is installed on the top of a telephone booth so as to be integral with said telephone booth.

3. An installation structure of an outdoor communication device according to Claim 1 or 2, wherein said outdoor communication device is releasably mounted to said mounting part.

4. An installation structure of an outdoor communication device according to any preceding claim, wherein an antenna is mounted directly on said outdoor communication device.

FIG. 1 (PRIOR ART)

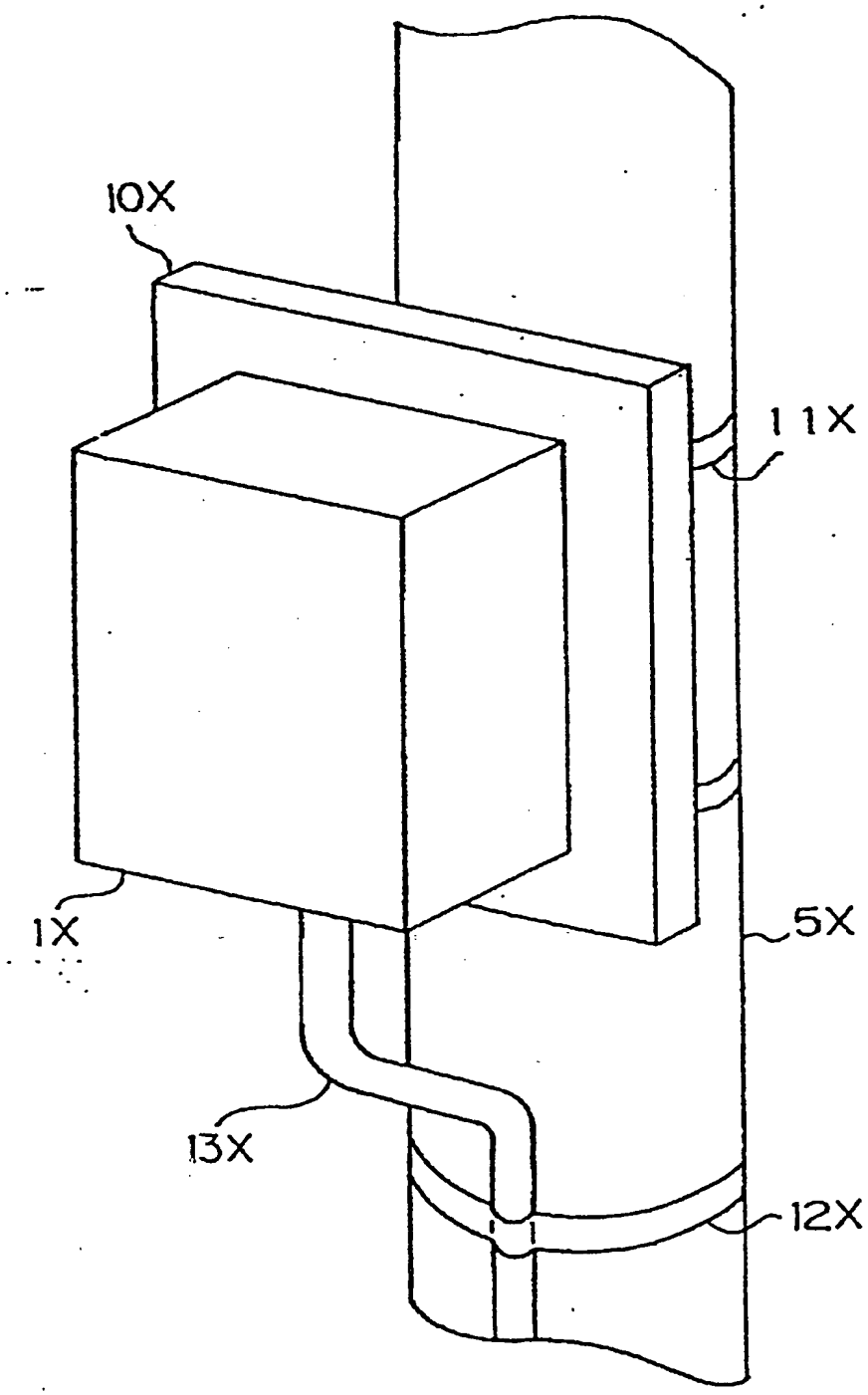


FIG. 2

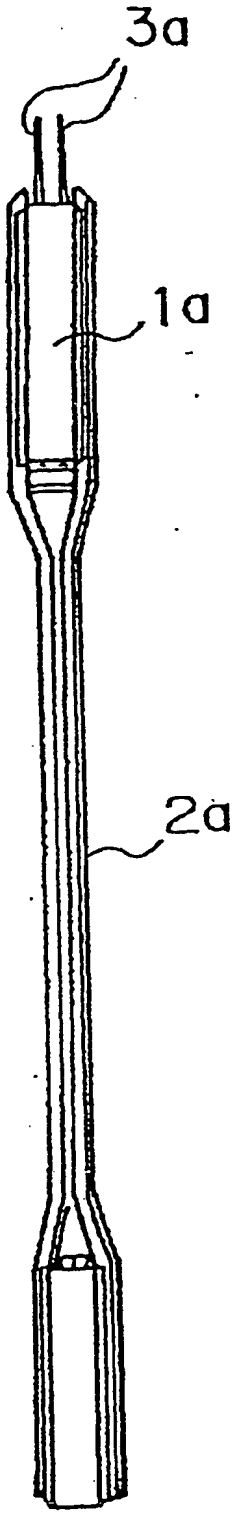


FIG. 3

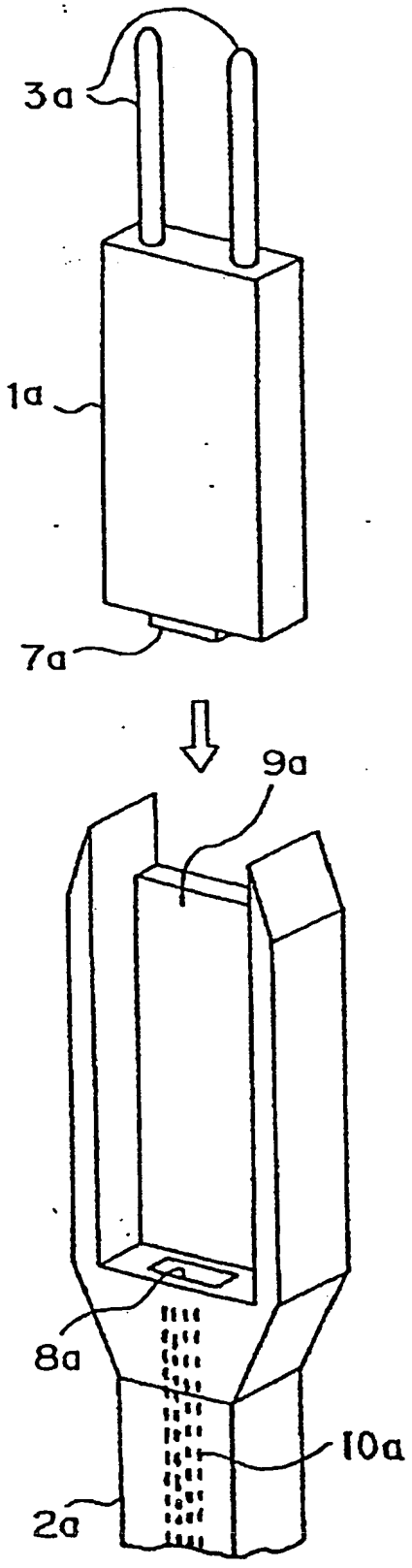


FIG. 4

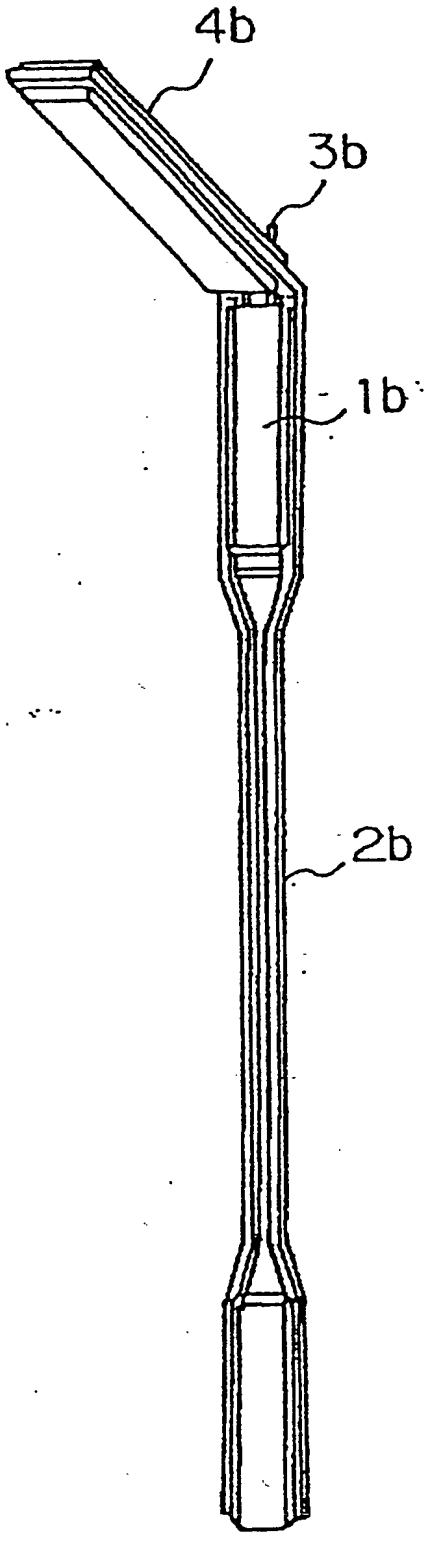


FIG. 5

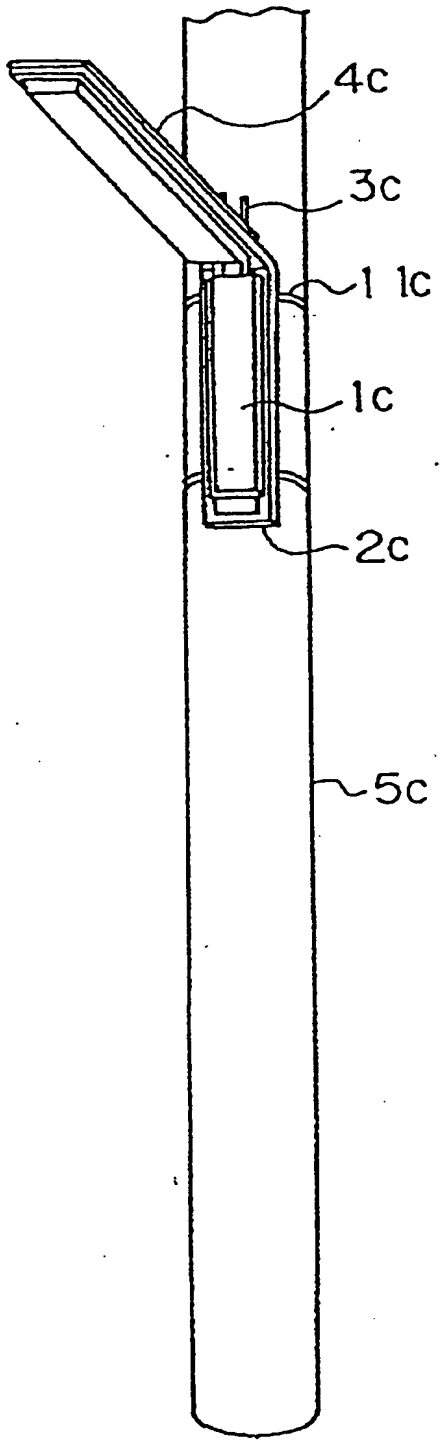
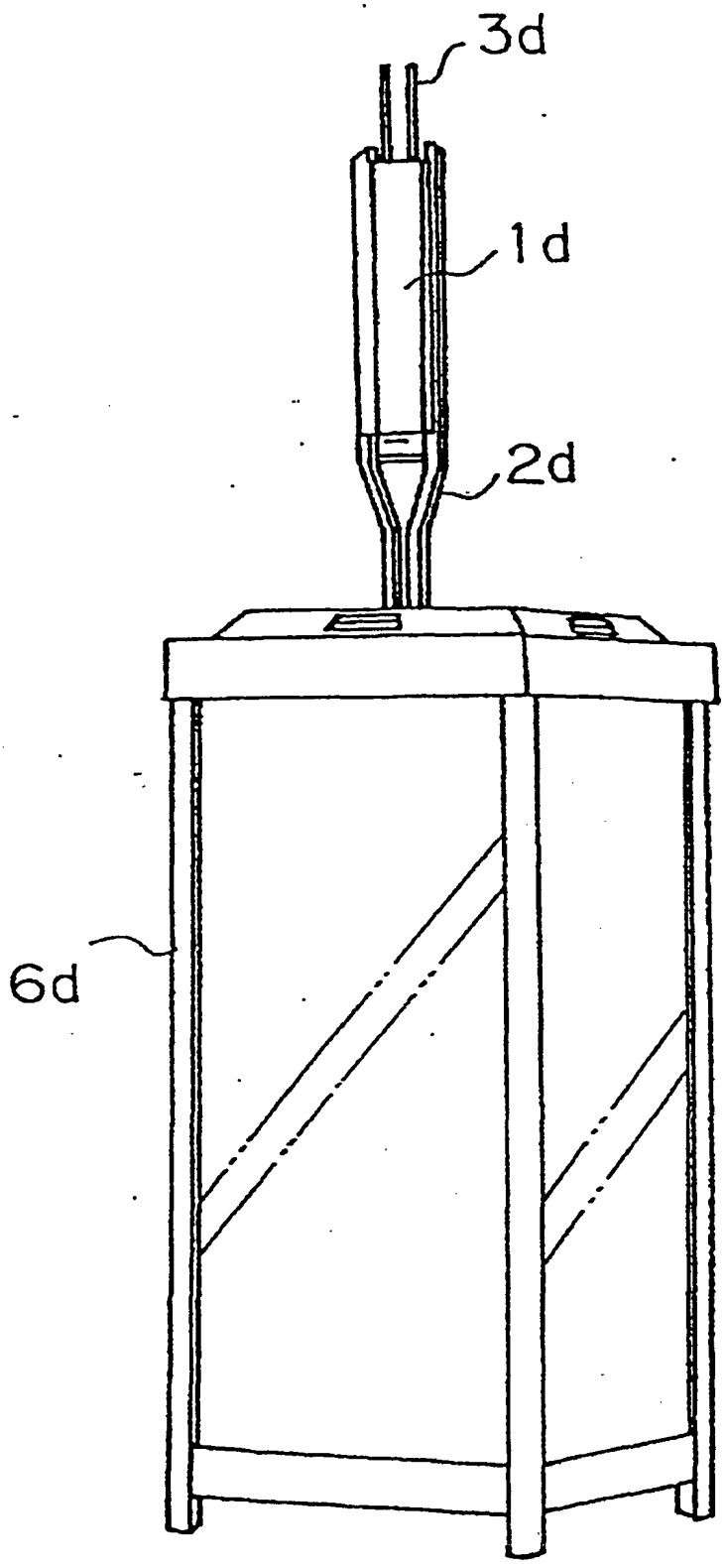


FIG. 6



European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 98 20 1758

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	PATENT ABSTRACTS OF JAPAN vol. 18, no. 280 (E-1555), 27 May 1994 & JP 06 053894 A (NIPPON STEEL), 25 February 1994 * abstract *	1	H01Q1/22 H01Q1/12 E04H12/08 F21V21/10
X	PATENT ABSTRACTS OF JAPAN vol. 17, no. 6 (E-1302), 7 January 1993 & JP 04 238424 A (NIPPON TELGR.&TELEPH.), 26 August 1992 * abstract *	2	
A	PATENT ABSTRACTS OF JAPAN vol. 15, no. 94 (E-1041), 6 March 1991 & JP 02 305075 A (TOSHIBA), 18 December 1990 * abstract *	1-4	
A	EP 0 580 505 A (ALCATEL RADIOTELEPHONE) 26 January 1994 * abstract; figures 1,2 *	3	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
A	EP 0 542 509 A (BIANCO) 19 May 1993 * column 2, line 36 - column 3, line 3 * * column 3, line 4 - column 22; figures 1,4 *	1,3	H01Q E04H F21V
A	US 4 998 095 A (SHIELDS) 5 March 1991 * abstract; figure 1 *	1,4	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	20 August 1998	Angrabeit, F

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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